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**Its History, Etiology,**  
**Pathology, and Treatment.**

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By J. LINDSAY PORTEOUS, M. D., F. R. C. S., Ed.



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## Myxedema, its History, Etiology, Pathology, and Treatment.

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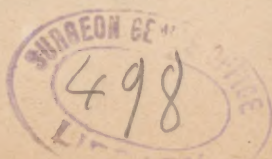
**HISTORY.**—In 1873, Sir Wm. Gull, of London, a man who possessed in a marked degree that which is necessary to make a great physician—namely, great power of observing and generalizing, which enables him to separate and individualize out of the vast and varied aggregate of what is generally called "disease," a special variety, gave a description of what he called a "disease". Doubtless this "disease" had existed before, but no one had previously described it. Gull observed that it resembled in many ways cretinism, and therefore called it a "cretinoid" disease. Besides distinguishing it he ventured to suggest the cause, and his suggestion ultimately proved to be correct. He thought that the thyroid gland had something to do with it, either from being attacked by some form of disease, or else from becoming atrophied. Little even now is known of the utility of the thyroid, but it evidently has something to do with blood-formation. In 1877 Dr. Ord, of London, gave to the medical world a more elaborate description of this strange disease, and also gave it a name, a most important addition. He called it myxedema, from two Greek words, *μῦξα*, mucus, and *οἰδημα*, a swelling.

It occurs most frequently in women, although now and then it is said to have appeared in men. The subjects of it are in mid-life, usually have been healthy, and frequently active in mind and body.

Several years after Ord's interesting communication, Kocher, a Swiss surgeon, noticed that after the removal of the thyroid gland all the symptoms of the "cretinoid" disease of Gull and the "myxedema" of Ord, appeared, thus confirming the theory of these two physicians, that the thyroid was the prime factor in this disease. He found also that if even the

smallest portion of the gland was left, these symptoms did not occur. The next advance made in the history of this disease was by Victor Horsley, of London, the well-known cerebral surgeon. He reasoned, that as Kocher had observed that even if a small portion of the gland remained after an operation these myxedematous symptoms did not arise, if he could by some means supply the want a cure would be effected. He, therefore, towards the end of 1889, boldly engrafted a portion of a sheep's thyroid under the skin of a myxedematous patient, with the result of perfect success being obtained. But he found that soon the pieces of thyroid he had engrafted or transplanted became absorbed, the patient relapsing into her former condition. This, although being a step in the right direction, was far from satisfactory. The next step in the mode of treatment was made by Dr. Murray, of Newcastle-on-Tyne, England, and published in the *British Medical Journal* of October 10th, 1891.

From experiments by Bettencourt and Serrano, of Lisbon, which consisted of engrafting a half of a sheep's thyroid beneath the skin below the mamma of either side of a woman, they remarked that the improvement commenced on the *day after* the operation. Such being the case they considered that it was due to absorption of the juice of the healthy thyroid gland by the tissues of the patient and not to the gland becoming vascularized and so functional. From this Murray argued that the same end could be attained by simply injecting the juice of an extract of a thyroid gland of a sheep or other animal beneath the skin. He says: "If we consider that myxedema and cachexia strumpvira are due to the absence from the body of some substance which is present





in the normal thyroid gland, and which is necessary to maintain the body in health, it is at least rational treatment to supply that deficiency, as far as possible, by injecting the extract of a healthy gland." Murray's theory has proved the correct one, and undoubtedly to him is due the honor of having introduced an easy, certain and practical form of treatment, which already has proved a boon to many a patient suffering from what was till recently pronounced an incurable disease.

ETIOLOGY.—Very much has yet to be learned regarding the cause of this disease. In several cases recorded, sudden fright or shock has been the supposed origin of it. In the case I am at present treating, and of which I will give full particulars later on, the beginning is very clearly traced to shock and cold combined, stopping perspiration and the menstrual flow. In many parts of the globe it is quite prevalent; such is the case in the east of Scotland, but whether it is caused by some endemic, telluric or climatic condition, it is as yet impossible to decide. Some nervous condition might underlie the disease, interfering with the innervation of the gland. It is very necessary that we should look to the great nervous system, to account for the beginning of many diseases not strictly of nervous origin. What conditions are necessary to cause the whole system to be permeated with mucin? What is the active principle of the thyroid which has the power in it to prevent this untoward condition noticed in myxedema? Such are some of the questions which must be solved, sooner or later, so that we may have a clearer understanding regarding the mysterious disease.

The malady shows us plainly that the whole body is a unity and must work well together to have what is called "health." The body is a chemical laboratory of so complicated and subtle a nature that the deficiency or superabundance of any of its substances which are formed and decomposed every minute, may cause disease, pain or death.

**PATHOLOGY.**—Dr. Greenfield, Professor of Pathology in the University of Edinburgh, was, when pathologist at St. Thomas' Hospital, London, the first to make a post-mortem examination of a person who had died of myxedema. It was the case that enabled Dr. Ord to name this hitherto nameless disease. He found that the thyroid was atrophied and considered that this was the primary, most essential fact to be noticed. The functions, then as now, of the gland, were very obscure—but there was a faint idea that it had something to do with the metabolic changes of the nutritive fluids, and that it had some relation to the elaboration of mucin. Dr. Greenfield suggests that it secreted a material of the nature of a ferment, which rapidly passed into the blood and stimulated the secretion of the skin glands, and in some way acted upon the heart. In sporadic cretenism the gland might be almost absent. Again, on the other hand, in exophthalmic goitre there was an exactly opposite condition, namely, an enormous increase in the secreting structure of the thyroid and also of the colloid material in the spaces of the gland. In ordinary cystic goitre, however, associated with cretenism, there was an enormous increase in its substance. Dr. Greenfield, reasoning from these facts, thinks that too great importance ought not to be attached to the morbid appearances of the thyroid in myxedema, or put out of our minds other considerations in relation to its functions. He thinks that a crucial test might be made by feeding a healthy person with thyroids and noticing if conditions analogous to those in exophthalmic goitre were produced. In myxedema, the sweat-glands and sebaceous glands acted defectively, and later atrophied, together with other parts of the skin. The lymph tended to accumulate and stagnate. Myxedematous patients show a marked proclivity to tuberculosis, but at the same time the tubercular process is largely modified. In five cases seen by Dr. Greenfield, death resulted from tuber-



culosis. There was a great power of repair in myxedema. Microscopically examined, the thyroid showed an advanced condition of atrophy with fibrous overgrowth; sometimes all gland tissue disappears. In one case recorded, there was lymphoid infiltration. There were changes in the epithelium, also in the arteries similar to those found in all chronic interstitial inflammations. There were changes in the hair follicles and in all the glandular elements. The epidermis becomes thin. There is often a deposit of pigment in the skin. The edema owes its character to its being more deeply situated than in ordinary anasarca.

The edema in the lips and tongue is also more deeply situated. In the tongue, patches are often most marked at a distance of a third of an inch from surface. In the skin, tongue, and other organs there are sometimes areas of dense fibrous overgrowth. The other organs, with the exception of the lungs, in the cases examined by Greenfield, were in a normal condition. In the kidneys there sometimes is a peculiar swelling and pallor due to the presence of a myxomatous degeneration around the arteries at their division, and an extension of a myxomatous and cellular infiltration between the tubules in that position, while the cortex was normal. In the nervous system there were no changes with the exception of indications of chronic neuritis in the peripheral nerves. This, however, may not be due to the disease, as all these changes have been observed in a patient who has died of cirrhosis of the liver.

A very interesting case has been related by Dr. John Thompson, in the *Edinburgh Medical Journal* of May, 1893.

In 1887, an unmarried woman, aged 51 years, applied for treatment to Dr. Thompson. She had all the symptoms of myxedema. The disease had progressed slowly, and seemed to be relieved by thirty minim doses of tincture of jaborandi three times daily. This relieved the dryness of the skin. She, however, suffered from

dyspepsia, constipation, piles, chilliness, and a distressing feeling of weakness and disinclination for exertion. In December 1892 she was ordered to take by the mouth a quarter of a sheep's thyroid twice a week. At this time her face was more swollen than it ever had been before, and she had large, fatty tumors in both supra-clavicular regions. Her temperature was  $97.5^{\circ}$  in the mouth, and pulse 80 per minute. After three doses no change in her condition was noticed, so she was ordered half a thyroid twice a week. Six days after this she had severe angina pains similar to what she had prior to treatment. This was chiefly *after* exertion. The heart-sounds were weak, but otherwise normal. The swelling of features was much diminished. Nitroglycerin, one minim of a one per cent. solution every 4 hours, was ordered. Six days afterwards she felt much relieved, but being very weak was ordered to stay in bed and stop the thyroid. Up to two days prior to this she had had three quarters and three halves of a sheep's thyroid. Five days after this the swelling of her features had entirely gone. Her appetite had left, tongue thickly furred; she complained of nausea and much pain over stomach; perspiration was profuse. Temperature  $98.6^{\circ}$ , pulse 110. Nitroglycerin stopped. Six days later got out of bed, and nearly fainted. The pain in stomach was severe, and constant inclination to vomit; pulse 108, very feeble, but quite regular. Hydrochloric acid and pepsin ordered. Next day patient was no better; was ordered not to sit up at all. Peptonised milk and whiskey given every three hours.

Two days later pulse and tongue both better. Ordered tincture of digitalis, 10 minims thrice daily. Next day pulse and tongue more nearly normal, but she did not feel better. That evening she sat up while bed was being made, and suddenly fainted and died. Two days afterwards a post-mortem was made. Decomposition had already set in to a considerable extent.



*Head.* Cerebral arteries atheromatous. Pituitary body enlarged, about the size of a small bean ( $1 \times 1\frac{1}{2}$  cms.) and very firm; its fossa unusually deep. Brain otherwise normal.

*Thyroid.* Both lobes looked at first sight normal in outline, but were extremely flabby and thin (like collapsed bladders), so that they could scarcely be felt with the finger among the surrounding tissues, even when they had been exposed by dissection.

*Thorax.* No remains of thymus. Pleurae and lungs normal. Pericardium contained about  $1\frac{1}{2}$  oz. of blood-stained fluid. Slight thickening of the mitral valve; otherwise all the valves were normal. The muscular tissue of the wall of the heart was in a state of *extreme* degeneration. It was very pale and brownish in color, and flabby in consistence. In many places it seemed to be largely replaced by fibrous tissue, and in others its place was almost completely taken by fat, owing to advanced atheromatous changes having obstructed the coronary arteries. Numerous soft atheromatous patches in the first part of the aorta.

*Abdomen.* Peritoneum normal; spleen and kidneys seem normal. Liver much decomposed, fatty, with numerous small, rather dry and firm, yellow areas scattered through its substance. Stomach and bowels not opened; externally, they appear normal. Uterus and ovaries practically normal.

*Microscopic Report.* *Thyroid* greatly altered in aspect. The gland structure was replaced by fibrous tissue; no trace of the glandular elements remaining, except at one or two points where loculi resembling the normal spaces were seen; these, however, contained no epithelium. The great mass of the tissue was densely fibrous, with few nuclei, but containing blood-vessels of varying sizes, all of whose coats were thickened, especially the middle and outer, which were studded with nuclei. The lumina of the vessels were in some instances filled with blood; in others,

were much reduced in size by the proliferation of their coats, and were empty. There were many cells in the section larger than giant cells, and contained numerous dark nuclei (or cells?).

*Heart.* Great increase of the connective tissue throughout the organ; at other parts considerable deposit of fat, especially under pericardium. The muscular tissue, which was much separated by the connective tissue, was generally atrophied. The bundles showed distinct transverse striation; the nuclei were small and the whole fibres seemed opalescent. The transverse section showed a remarkable appearance. The centre of the fibre seemed replaced by a yellowish substance, around which the muscular fibre was arranged like the rim of a wheel. The fibre was studded with granules of varying size, some highly refractive. The yellow pigment had no apparent relation to the nucleus.

*Skin.* The cutis vera, relatively, considerably deeper than the epidermis. The stratum corium was increased, proliferating and desquamating at parts. The retê malpighii was shallow, consisting of but a few layers of cells which did not stain deeply, except at the basement; otherwise the cells were natural. The upper part of the cutis vera showed a layer of dense connective tissue, but the rest of the true skin seemed more open than usual.

*Hair.* The structures were altered. The sheaths were increased, and contained numerous deeply stained nuclei, especially the outer sheath. It was short and stunted; papilla normal. The sebaceous glands did not show any abnormality. The sweat glands and ducts had their connective tissue increased.

*Liver* showed chronic venous congestion. The cells were cloudy; otherwise the stroma and vessels and cells showed the usual appearances of the condition.

*Kidney* showed chronic venous congestion. The increase in the amount of fibrous tissue was considerable. The parenchyma of the organ could not be examined on



account of the condition of the epithelium. *Superior* cervical ganglia and vagus presented no noteworthy alteration.

*Pituitary body* was found distinctly congested, the capillaries being distended; some parts of the gland were normal—others, not so. The lumen of the acini were often occupied by colloid material, and the appearance of the sections was very like that of the thyroid gland at an early stage of development. A certain amount of the cystic formation is normal in the pituitary body, but in this case there was more of it than usual.

*Remarks.*—I have quoted largely the post mortem appearances as found by the pathologist and microscopist; as it is the only case recorded when a sectio-cadaveris was made after the new treatment had been applied. I think that the cause of death was to be found in the heart-muscle, although the changes brought about by the treatment may have accelerated it. The lesson to be learned from this case is, that we ought to be very particular to diagnose correctly the condition of the heart before commencing the thyroid treatment. We should commence in all cases with a small dose, especially when we suspect fatty heart, and enjoin absolute rest during the time of treatment.

**SYMPTOMS.** Myxedema comes on slowly and insidiously. It rarely develops rapidly. Inability to perspire, increased susceptibility to cold, a feeling of weariness, aversion to exertion, both of body and mind, and a desire to sit rather than stand or walk, are among the first symptoms of the disease. As the malady advances the features change. The lips get blue and the face becomes puffy. The trunk and limbs likewise enlarge. This swelling differs from dropsical swellings by not pitting on pressure. It is seemingly solid, and has a characteristic resistance when touched. As the disease becomes more fully developed the face gets broad, coarse, round, and bloated-looking, resembling an orange in shape.

The lower lip is much thickened and

feels firm, resembling, when touched, a solid piece of india-rubber. The nose becomes broad and flattened, not unlike the nose of the negro. The eyelids, at first sight, strike the observer as those of a person advanced in Bright's disease. The upper lids seem to droop, which gives the impression that the eyes are very small, but at the same time the eyebrows are elevated and the head slightly thrown back; the former is caused by an involuntary contraction of the occipito-frontalis muscle, which nature uses to compensate for the lessening of the field of vision caused by drooping eyelids. To the touch the skin of the lids is soft, and looks like wax and is almost transparent. There is a pink blush on cheeks and nose; at times the pink becomes purple. The skin is of a brownish-yellow appearance, especially when exposed to the atmosphere, with sometimes a mouse-colored patch on the side of face. There is sometimes a dirty-brown encrustation on the scalp—baldness, thin, dry, rough condition of the hairs. The eyebrows generally become thin or disappear altogether. The tongue seems too large for the mouth, interfering greatly with articulation. On examining the inside of the mouth we see an edematous condition of the mucous membrane of cheeks, of the pharynx, larynx, and fauces. Deglutition is difficult and sometimes painful. The hands are broadened and "spade-like". The feet the same, but not so marked. The body is much increased in girth. Sometimes there are elastic swellings above the clavicles. If the disease is far advanced, the thyroid often cannot be detected, but this is not of much significance because it is very difficult to find it by palpation during life; and besides that, it need not be atrophied to cause myxedema, but may be functionally inert by its structure becoming altered and destroyed.

The dirty-brown crusts on the head are very important diagnostic features of the disease, although cases do occur without such being the case. The nails often become dry and brittle. Baldness may or may not appear. Flat moles are often present on the skin.



The expression is stolid, heavy-looking and apathetic. Cerebration, especially speech and movement, is slowly called out. The gait is heavy and clumsy, termed by Dr. Byron Bramwell, "hipopotamus-like". Speech slow, thick, monotonous. There is often a choking sensation. A myxedematous subject takes a long time to answer a question and is unusually placid, cool and stolid. In some cases the mental deterioration is so great that the patient becomes insane. Sight and hearing are sometimes impaired. Such is the case in the patient I am now attending. The sense of touch is diminished. The temperature of the body is low, 94 to 96°. The morning and evening temperature are usually the same. The daily rises and falls which occur in a healthy person are almost entirely absent. Often in myxedematous patients the temperature does not rise under conditions which tend to elevate it in health (Bramwell). There is slight anemia. The red blood-corpuscles and the hemoglobin are usually moderately diminished in amount.

It is most common in women who have borne large families. Amenorrhea is often present. There is undoubtedly some functional sympathy between the thyroid gland and the sexual organs. I have seen a woman whose thyroid became swollen and painful at each menstrual period, and gradually became normal as the menstrual flow ceased.

The urine is generally normal, but sometimes has albumin. Cirrhosis of the kidney is sometimes present, especially in old patients, hence the albumin; but albuminuria may be caused by the myxedematous condition independent of kidney disease. In proof of this a case has been cited in which the albuminuria entirely disappeared during thyroid feeding.

**DIAGNOSIS.**—In fully developed myxedema the diagnosis presents no difficulty, but there is difficulty in the early stages. In acromegaly the temperature may be subnormal, also the pulse slower, as in myxedema, but as the disease advances the symptoms widely differ.

In a young person the characteristic blush may be absent. In the early stages the swelling of the face, the slowness of thought, speech and movement are apt to be overlooked as they may be only slightly marked, but the great susceptibility to cold, absence of perspiration, or indeed any moisture on the skin, the enlargement and rubber-like appearance of the lower

lip and the dislike to exertion, both mentally and bodily, are almost always present and can be relied upon as a pretty sure proof that the disease is myxedema.

**PROGNOSIS.**—Until recently the prognosis was bad. Ord said the patient died in from six to twelve years from the commencement of the disease, but now, since Dr. Murray has introduced his subcutaneous injection-of-extract-of-thyroid treatment, the prognosis is decidedly favorable, especially when the heart and kidneys are in an otherwise healthy condition.

At present I am treating a case which seems to me a most typical one and will illustrate very clearly the symptoms and treatment of this strange disease.

Mrs. P., aged 50, came under my observation four years ago, and presented the following symptoms: Face puffed, also eyelids; skin, yellowish-brown; mouse-brown marks on both sides of face; pink blush on cheeks; lips blue and thick—lower lip much everted; hands thick, large, dry and scaly. She said she felt the cold very keenly, and even in summer often wore a fur cape. Could fall asleep at any time, and did not care to exert herself either mentally or physically. The breath was offensive, urine scanty and bowels constipated; she feels a tightness on the chest and desires to take a deep inspiration. Her memory was bad and she could not articulate plainly; complained of pain over the region of the thyroid. Her temperature at times was low (95° F.), and she had not perspired for five years. She also had soft, flat moles on the face and side of the neck. Heart sounds were normal; there was neither sugar nor albumin in the urine. Frequently she lost her voice and showed symptoms of strangulation. These symptoms continued, although, under digitalis and tonic treatment, they did not get worse; in fact, she seemed to lose to a certain extent, the swollen condition of her body. She dates the beginning of her illness to a fright she had nine years ago. There was an alarm of fire at night, and while perspiring and menstruating she rushed out of doors thinly clad. From that date both perspiration and menstruation ceased.

Reading in current medical literature of the wonderful discovery made by Dr. Murray, of Newcastle-on-Tyne, I determined to try his treatment. I endeavored to obtain a regular supply of thyroids, and with difficulty made arrangements to have them; but the hot weather setting in, I rather dreaded to use them as directed by Dr. Murray.

For the benefit of those who have not read Dr. Murray's article, I will here give the mode of preparing the extract.

"Remove the gland as soon as possible after the sheep has been killed; remove surrounding fat and connective tissue. Sterilize all the instruments and glass vessels used in the further preparation of the extract, by heat, or thoroughly cleanse with a 1 in 20 solution of carbolic acid.



The gland is cut up in a glass dish into small pieces and then placed in a test tube with one cubic centimetre of pure glycerin and one cubic centimetre of a 0.5 per cent. solution of carbolic acid. Close the mouth of the tube with a plug of cotton wool and allow the mixture to stand in a cool place for twenty-four hours. The mixture is then placed in a fine handkerchief, which has previously been placed in boiling water for a few minutes. It is then firmly squeezed by screwing up the handkerchief so as to express as much liquid as possible. By this means, three cubic centimetres (50 minims) of a turbid, pink liquid are obtained. This preparation will keep quite fresh for at least a week. It should be kept in a small bottle with a glass stopper.

"The extract thus obtained may be given in two equal injections (25 minims), during the week, so that at first the patient receives the extract of one sheep's thyroid in the course of a week."

The above was the plan adopted by Dr. Murray, and since then others have given the gland raw as a sandwich; others have partly cooked it. Some give as much as two glands a week; others as little as the eighteenth part of a gland weekly. Allan and Hanbury, of London, prepare what they call "*Thyroidin Tabellae*," which seem to answer the purpose well. For the reason given above, I did not try the thyroid feeding or the thyroid extract, but applied to Parke, Davis & Co., of Detroit, who supplied me with a preparation of desiccated sheep's thyroid in the form of a powder, fifteen grains being equivalent to an average-sized sheep's thyroid. The action of this has proved most beneficial, as the following details will show.

On May 10th, 1893, the patient's temperature was 96° F.; skin, dry; pulse, 70 per minute and feeble. I ordered five grains of desiccated thyroid to be taken in the morning before breakfast. May 11th, at four P.M., I found the following condition: Temperature, 99° F.; pulse, 88; urine very offensive; alkaline in reaction; quantity, fifteen ounces in twenty-four hours. Ordered five grains to be taken at bed-time. May 12th: Temperature, 98° F.; pulse, 90; had most profuse perspiration during the night—the first time she has perspired for nine years, and felt "bright" and "strong."

The patient had to leave home for a few days, and I did not see her again until the eighteenth. During the interval she had felt better than for years, and the perspiration had continued, although not profuse. The temperature was 97.2° F.; pulse, 64. Ordered five grains of the powder to be taken at bed-time—if she did not feel tired. May 19th: Did not take powder as she felt tired; the moisture on the surface still continues, and there is already a decided change in the features; the bloating has partly subsided. May 20th: Patient took five grains previous morning, also in the evening. The temperature had fallen to 97° F.; pulse, 70; skin moist. May 21st: Temperature 98.5° F.; pulse, 75. May 22nd: Temperature, 99° F.; pulse, 82; patient had taken a five-grain powder the previous night.

A photograph taken at this date shows that the features have already lost a good deal of the characteristic appearance.

May 23: Temperature, 98.6° F.; pulse, 82; she feels very well and cheerful, and articulation is much improved. The urine at this date was normal in color, with no odor, and sufficient in quantity. The hands begin to lose the spade-like shape, and look smaller.

May 24: Temperature, 97.6° F.; pulse, 80. The backs of the hands are much smoother and the scaly appearance is leaving; she feels tired, but is able to be out driving. The hearing is much improved.

May 25: Took a powder the previous night; feels well and is very cheerful and has perspired freely.

May 26: Temperature, 98.4° F.; pulse, 86. Can now articulate perfectly; there is no thickness of speech, and the blueness of the lips is almost absent; appetite is good.

May 27 and 28: Patient continues to feel well, and had taken quite a walk to an entertainment, staying late and feeling none the worse for it.

May 29: Had two powders yesterday and one this morning. Felt tired and weary, and the powders were stopped for forty-eight hours. She is alarmed at the rapid rate she is becoming thin.

June 1: Patient took five grains of the powder this morning and feels weak. Pulse 88 and irregular; temperature, 98° F. Evidently the powder was having a toxic effect, so again stopped them and ordered gr. 1-100 digitaline. Patient complains of pain on the nape of the neck; also on right tempo parietal region; she experiences a sense of weight in both hips, with difficulty in raising the legs to go up stairs. Passed urine twice during the night, which she has not done for years. Skin naturally moist. She is much thinner in body, hands, arms, and face; can make first finger and thumb meet around the wrist, something she has not been able to do for several years.

June 3: Temperature, 97° F.; pulse, 85; skin moist. Ordered a five grain powder to be taken next morning.

June 5: Temperature, 99° F.; pulse, 84; felt in good spirits; not tired, but "shaky" when walking.

June 6: Temperature, 98.4° F.; pulse, 90. Felt very well; got up early and was walking round the garden.

June 8: During yesterday and to-day, had done more about the house and outside than she had for years.

June 9: Photo taken to-day showed a marked improvement. Temperature, 98.4° F.; pulse, 85.

June 10: Temperature, 98.4° F.; pulse, 85; very bright and cheerful. Took five grains of the powder this morning.

June 12: Temperature, 98.4° F.; pulse, 90; feels very well; had been up since six A.M., and in the garden; also had a long drive, but did not feel fatigued. Took five grains of the powder last night.

June 14: Patient's hearing is now quite restored; temperature, 98.4° F.; pulse, 80.

June 16: Took a five-grain powder last night. The flattened mole on right temple is greatly diminished—not so much in circumference as in prominence.

June 18: Quite astonished her family by leading the singing of hymns and playing the accompaniment herself. Her voice and articulation seemed quite restored to their normal condition, after being much disordered for eight or nine years.

June 19: Took five grains of the powder last night; feels in excellent health. Temperature, 99° F.; pulse, 80. Feels the heat rather oppressive; skin moist.



June 21: Temperature, 98.4° F.; pulse, 80. The grayish-green scurf on scalp has now almost disappeared. The hair feels much softer; the moles are smaller; the urine has been normal in every respect since the 19th of May. On the latter date the patient's waist was found to be seven inches less in circumference than on May 10th.

*Remarks.*—Up to the present date (June 21, 1893) 55 grains, equal to three and two-thirds sheep's thyroids have been taken, and the patient has improved far beyond the most sanguine expectations. She leaves now for the seaside with instructions to take one powder of five grains once a week and rest for twenty-four hours after taking it. In this case, as in most of those I have seen reported, the first dose caused the most perspiration and the greatest rise in temperature.

As to the permanence of the relief, I cannot venture an opinion. Sufficient time has not elapsed since the discovery of the treatment to warrant anyone to prophecy the ultimate result; but as the case so quickly and thoroughly responded to the treatment, we may hope that the functions of the gland were only temporarily suspended, and there is still another human being grateful to Dr. Murray for his very wonderful discovery.

I will now in conclusion endeavor to give a summary of the most important and interesting features of fifty-eight cases, the reports of which I have collected from different medical journals. The average age when advice was sought and thyroid treatment commenced, was 45 years. The oldest patient was sixty-four, and the youngest seven years. There were fifty-four females and four males. Three of the cases treated were said to be congenital. Average duration of disease when treatment was commenced, was almost seven years. Thirty-three cases were treated by subcutaneous injection of thyroid extract; of these, only six had no unpleasant symptoms. The remaining twenty-seven had either abscesses, faintings (the most prevalent), malaise, epileptiform convulsions, headache, pains in limbs or back, nausea, giddiness, or local inflammations, but none of an alarming nature. The extract used was either that of Dr. Murray, or that prepared by Brady and Martin, Newcastle-on-Tyne, of which ninety minims correspond to one sheep's thyroid. The doses ranged from  $\frac{1}{110}$ th of a thyroid daily to two-thirds of a gland during the same period. The remaining twenty cases were treated by the internal administration, either of the extract pre-

pared according to Murray, or that of Brady and Martin, or by the desiccated powder of Parke, Davis & Co., of Detroit, or by eating the gland raw or partly cooked. By this latter method, the only unpleasant effects were fainting, slight pains in the chest and back of neck, or a feeling of languor. Under both plans of treatment the improvement was equally well marked, but as a rule, the hypodermatic method responded more quickly.

Only one death while under treatment was recorded, and that was from fatty heart. The dose ranged from five minims of an extract (equivalent to one-eighteenth of a thyroid) to two thyroids daily. Not one case of failure to relieve has been recorded in the fifty-eight cases here collected. True, some have relapsed after the treatment had been stopped for several weeks, but when re-commenced the beneficial effects were again produced. One of the cases reported was that of a woman aged forty-three, who suffered from insanity, at times of a violent character; at other times her mental condition was one of exaltation. After four injections her demeanor was quieter; and after six injections the swelling began to disappear. At the end of two months her mental condition was almost normal. Grafting of thyroid was performed with much benefit after injection, in the congenital cases.

Time must elapse before we can be certain that the beneficial effects will be permanent. If the gland is destroyed, it stands to reason that no treatment will restore it, and the medicine must be continued indefinitely; but if its function is only temporarily impaired, the treatment may do much to aid it in regaining its normal condition.

This discovery, whether it absolutely cures, or only prolongs life and diminishes suffering, must be placed in the fore-front of the many useful discoveries of the nineteenth century. Following in the wake of the thyroid treatment in myxedema, we will soon see extracts of the kidney for Bright's disease, or the internal secretion of the supra-renal capsules for Addison's disease, etc., etc.

*Note.*—Since writing the above I learn that a Dr. Ireland, of Scotland, when recently reading about myxedema recalled a case which came under his treatment in 1854, and which proved fatal one year after he first saw it. Dr. Ireland says he distinctly recalls all the symptoms peculiar to this disease.

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